ELECTRICITY on the FARM

THE NATIONAL MAGAZINE OF RURAL ELECTRIFICATION

AUGUST 1942

THIS MONTH—

Pyler's Pressure Extend Garden
Water Increases Production
Milk Cooling Comparisons
Electricity in Hog Production
Small Motors in Pennsylvania
Three-Way Switches
Elevator for Shelled Corn
Preparing Foods for Freezing
Making Your Rubber Last
Roaster Care ★ Sugar Banks

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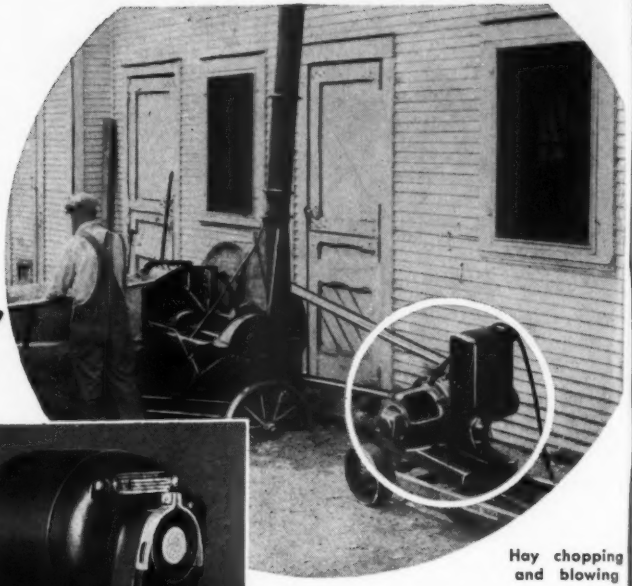
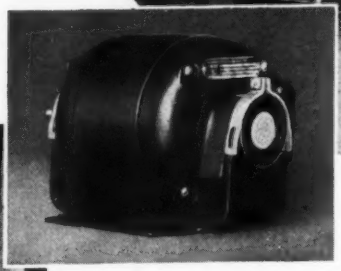
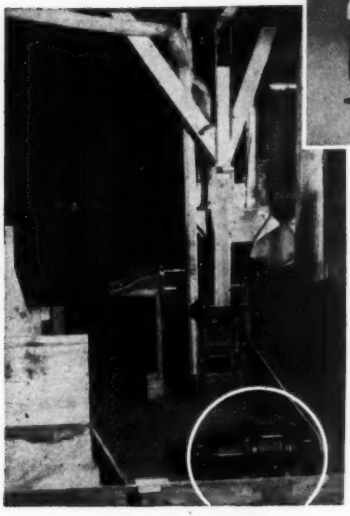
6 WAYS TO KEEP *"Wired Hands"* FIT



Hay chopping and blowing





Feed grinding and corn shelling

AS THE farm-labor shortage grows increasingly acute, "wired hands" are more and more being substituted for hired hands to help produce the food that's going "to win the war and write the peace." On farms from coast to coast these electric motors are grinding feed, chopping hay, sawing wood, threshing grain, pumping water, and doing many other jobs; it is imperative that they be kept in tip-top operating condition.

These six steps to prevent trouble will help you avoid costly breakdowns, and the repairs that probably could not be completed for weeks.

1. Check motors frequently to keep bearings, windings, etc. free from dirt and grime.

2. Keep bearings *properly* lubricated at all times, using light oil in babbitted sleeve bearings and light grease in ball bearings. Remember that too *much* lubricant is as dangerous as too little.

3. Remove motors from hazardous or extremely dusty locations (unless properly protected with some type of enclosing shield).

4. Check belt alignment to avoid unnecessary bearing wear.

5. Provide positive overload protection. (This consists of a device that automatically shuts off a motor when too great a load is put on it.)

6. If motor is obviously not operating properly (smoke, scorched insulation, excessive noise, etc. are signs of probable breakdown), do *not* operate until it has been thoroughly checked by a competent electrician and the cause removed.

Your local electrical dealer will gladly work with you to keep your motors "healthy." In certain cases a short note to the Rural Electrification Section, General Electric, Schenectady, N. Y., will bring a solution to your motor problems. In any event, mail the coupon today for your copy of a valuable, 16-page manual on the care of electric motors.

General Electric, Sec. 303-7
Schenectady, N. Y.

I want to keep my "wired hands" fit; send me a copy of "How to Care For Motors" (GEA-2856A).

Name .....

Address .....

Post Office ..... State .....

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GENERAL ELECTRIC

Editor's Chat

Milk Coolers and Food Freezers

Under the priorities system set up for farm machinery and equipment, milk coolers could be purchased by dairymen without a priority. They may still be so purchased where dealers have them. Recently all refrigeration equipment was covered under order L-38. In order to obtain a food freezing cabinet, it is necessary to fill out a PB-1-A application form and submit it to the WPB. You will need a priority rating of A-9 or better to obtain a freezer from your dealer. He will need the priority to replenish his stock. There is some confusion just now as to whether milk coolers are farm equipment or refrigeration equipment. It should be settled shortly.

Beautiful Country

My "chat" this month is being written on a Great Lakes steamboat. I am on my way from Chicago to Buffalo after attending the meeting of the American Society of Agricultural Engineers in Milwaukee. This is my first Lake trip. The country where we have stopped — Mackinac Island, Midland, Ontario, and down through the St. Clair River and Lake St. Clair this morning to Detroit —has been beautiful.

All the boats—passenger, ore or grain boats—carry armed guards, and cameras are taboo in strategical spots. The all-out effort for war is in evidence alike on both sides of the border. Aside from this "We'll lick 'em" spirit and activity, life goes on happily for most people. Ten-cent stores in Midland wear the same names and are as popular as in Brink's Corners or New York City.

The way of life, the freedom to cross the Border and to talk and do as one pleases, more than ever impresses itself as a heritage. Our common people who are privileged to think and act as conscience dictates, the beautiful lakes and land unperturbed by war—they are worth fighting for.

Share to Win

One of the papers presented at the A.S.A.E. meeting in Milwaukee was prepared by Charles L. C. Bosanquet, Assistant Secretary, British Ministry of Agriculture and Fisheries. He reported a great increase in the use of tractors in England, and as we might expect, the plowing up of estates and some of the fine old grass pastures for producing food crops during the war.

In order to provide machinery for farming the additional acres, a county system of exchange and assignment has been set up. Where machinery is needed on one farm and is not being used at the time on another, it is assigned to the farm where needed. This permits a greater use of available equipment and an increase in production with a minimum demand for additional critical materials needed for war purposes. A system of keeping the equipment in repair is also in vogue.

With prospects for greatly curtailed production of farm machinery in this country for 1943 we face the likelihood of some sort of rationing of new equipment and a possible voluntary or compulsory "share to win" program of our own. It is something to think about.

Prepare for Peace

The allied nations were unprepared for war. We have been soundly whipped to date—out-maneuvered, out-smarted, outfought and continually forced to give ground and retreat. Eventually we will win! Will we be ready for peace? There is grave danger when reconstruction comes that we will continue to be regimented, and bossed by a dictatorial government. The only way we can recapture and preserve the freedom and liberty for which we are fighting is for the common people—you and me—to be ready to say **NO,** and say it quick and loud, to the internal enemies of our democratic system when the war ends. We must stand united now to fight the war! United then—and prepared—to save our liberty!

George W. Kable

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Freezers Extend Garden Through the Year

A Record of Freezing Foods to Feed a Family on a Connecticut Farm

By MRS. WADSWORTH G. FYLER

Mrs. Fyler is the mother of three boys 18, 10 and 8 and two girls 16 and 12. The Fylers moved from the city to a farm in West Simsbury, Conn. five years ago and have been learning to farm by study and experience. Mr. and Mrs. Fyler and the oldest son are all seventh degree Grangers and members of the Hartford County Farm Bureau. The four oldest children are all members of local 4-H Clubs. The 120-acre farm is largely wooded—reforested with 16,000 trees. They have 500 hens, a cow, heifer and calf, five lambs, two goats and a pig. Mr. Fyler still works in the city during the week.—Editor.

NOT many new ventures are as completely satisfactory from the start as our farm freezer has been.

Of course I was skeptical at first. Canning had been such a big problem for our family of seven that I was afraid of something new. It seemed like a sizable investment; and then I might not be able to process the food right. So far it seems impossible to fail.

We first called on a farmer who owned a quick freezing unit. He and his wife were so enthusiastic about their freezing cabinet that I was immediately convinced that I wanted one.

My husband investigated several makes of boxes as to construction, durability and also the efficiency of the freezing unit. The one on which we decided has five inches of cork insulation, which is very important for economical operation. Our electric company loaned us a check meter, and on an average for a year at 2c a kilowatt-hour our monthly cost was $3 on our 26 cubic foot unit. This box is equivalent in capacity to 4½ lockers in a locker plant.

Our food bill has been reduced considerably in spite of our growing children, whose appetites increase each year. We have actually saved the cost of the box already in its first year of use.

The first thing we packed in our freezer was red raspberries. We made a fifty percent sugar syrup and kept it on hand in our household refrigerator so it would be cold. It was a simple task to wash the berries, fill the containers and pour on the syrup, leaving an inch space at the top of each container for expansion. My husband and eleven-year-old daughter packed a case of 24 pints of raspberries in twenty-two minutes. It was a profitable undertaking.

Mrs. Fyler in her work room.

Berries cost	$3.00
Sugar cost	.69
34 pint containers cost	.44
Total cost	$4.13
Retail value of frozen berries at the time we consumed them	$19.04
Saving ($19.04-$4.13)	$14.91

Red raspberries keep their bright color and the syrup preserves the flavor. Sometimes we used a honey syrup and liked it fully as well. We made it of one pound of sugar, one pound of honey and one quart of water.

We froze blackberries from our farm in the same way and have enjoyed them all winter on our breakfast cereal and for desert and pies.

We also froze our vegetables from our garden. As one freezer owner said, "It made it possible to have a steady flow of fresh garden vegetables on the table all through the winter months."

Five bushels of corn-on-the-cob was also frozen. It has been just as delicious eating as the day it was picked. We had a picnic on Memorial Day and roasted corn over the outside fireplace. We are also enjoying green string beans, wax beans, lima beans, broccoli, cauliflower, Swiss chard, blackberries, blueberries, raspberries and many other vegetables and fruits.

The family likes the flavor and appearance of the quick frozen fruits and vegetables much better than canned foods. We find that we can save the containers the products were frozen in and use them again, which makes a further saving.

We did our usual amount of canning last year and this gave us a direct comparison between the labor involved in quick freezing and canning. From our records we have found that on the average it takes fifty per cent. less time to process for quick freezing than to can. Also, we have had no failures or spoilage of quick frozen foods while we have had many in canning.

Last fall we froze a side of beef, four lambs and a pig. This meat was cut and wrapped in the size packages needed for our family use. The meat was very tender and good. Having it handy at home saved miles of travel, and in these days of gas and tire shortage this is important.

In November we had quantities of sweet cider. As an experiment we filled 29 pint containers with cider. Happily we found that when this frozen cider was defrosted several months later, the cider was as sweet as when frozen.

From July 14, 1941, to August

Left and Right: Waddy (18), Grace (13) and Ruth (15) preparing and storing food in the 2-26 cu. ft. freezing cabinets. Note the work table at left with roll of wrapping material and storage shelf above, refrigerator for keeping products fresh until they can be processed, and electric range for blanching and making syrups.

17, 1941, we froze 612 pints of farm products from our garden, principally berries.

Cost of syrup	$4.16
Cost of containers	8.74
Total expense	$12.90
Value of foods when used	$126.96
Less cost to us	12.90
Net savings	$114.06

In August and September we froze 600 pints of vegetables.

Retail value when used was	$189.55
Cost of containers, etc.	27.79
Net saving	$161.76

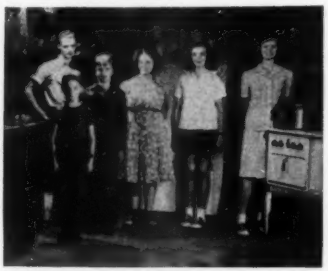
The total hours of labor on these 1212 pints of fruit and vegetables was 37 hours and seven minutes.

A family of seven uses about 250 pounds of fat in a year. In 1940 we purchased 250 pounds of butter at 40c per pound, costing $100. In 1941 we saved 150 pounds of fat from hogs and beef and bought 100 pounds of butter at 39c per pound. Buying butter in quantity saved us 5c per pound. The difference in cost of fats purchased in 1940 and 1941 was $61.

We also purchased 150 quarts of ice cream at bulk prices, saving 15c per quart over retail prices, or a total of $22.50.

Meat frozen included the following with the actual savings over day to day purchases as shown.

Kind	Lbs.	Retail Per lb.	Cost Per lb.	Savings Per lb.	Total
Beef	495	$0.33	$0.23	$0.10	$49.50
Lamb	199	.35	.24	.11	21.89
Pork	250	.30	.15	.15	37.50
Bacon	5	.49	.33	.16	.90
Liver	10	.35	.22	.13	1.30
Turkey	35	.55	.44	.11	3.85
Total meat savings					$114.94



This is the Fyler family (except dad) that grows the garden, raises 4-H Club livestock, and lives all year on "fresh" foods full of vitamins out of the garden and freezing cabinets.

The actual saving which may be credited to the freezer may be summed up as:

Meat	$114.94
Fruit	114.06
Vegetables	161.76
Butter and fats	61.00
Ice Cream	22.50
Total	$474.26

Last year we froze foods until our unit was full. Then we moved the contents to a public locker plant and filled up the unit again. The locker plant trip was over sixty miles. Still we thought it was worth while to increase our frozen food supply. This spring we bought our second twenty-six cubic foot freezer.

With the present shortage of sugar, rubber canning rings, jars and other necessities for preserving food, this freezing method is a life saver. Berries, for instance, can be frozen and made into jelly, jam or pies at any time of the year when sugar may be available.

We keep frozen pies, biscuits, doughnuts, bread and rolls in our freezer. These are just like fresh when defrosted. The pie crust is as flakey as when it is just out of the oven.

We also freeze frankfurters so we can have them for a picnic on a minute's notice. Our frozen home-made fresh sausage is delicious and the bacon and fresh ham keeps much better in the freezer. When I make a quantity of cottage cheese I store some of it in pint jars in the freezer to be used when the cow is dry. Our cracked eggs are taken out of the shell and put in paper containers during the low priced season and used when the price of even cracked eggs is high.

Water Systems Increase Production

Winning Letters in Our June War Production Contest. More Milk, More Eggs, More Pigs, More and Better Berries and Field Crops and More Time for Other Work Made Possible by Electric Water Systems

THE subject of the June contest was "How An Electric Water System Increased Production on Our Farm."

$20 First Prize Letter

• **Before electricity became available,** a patch of drilled cane, strawberries, blackberries, and other valuable field, garden and fruit crops sizzled in a burning sun. A year later, when the high-line came by, my husband, with the help of two men, dammed a little spring-fed stream. An electric pumping outfit costing $127 and the labor of two men while water is being applied made the difference between sorgo ensilage that ran 20 tons an acre and that which produced only 3 tons before our electric pump outfit was installed.

A 17-acre field last year produced $716.40 worth of seed and $163 worth of forage, averaging about $52 an acre. In addition we sold 120 shocks of the topped stover at 65 cents each and put up 142 shocks for winter feed. With this and other feed we made gains of 1.6 pounds a head daily on our steers.

Later we piped water from the dam to a trough in our hog lot, and when it comes to saving labor and time in producing pork-for-freedom our electric water system is hard to beat. An automatic float keeps hogs supplied with water constantly. Another water connection carries water directly to a large tank that my husband uses in soaking shorts to be fed as mash, helping him produce more pork at less cost and less labor.

Another outfit consisting of 1¼-inch pipe, pressure gauge, relief valve, standpipe to equalize pressure, light-weight, easy-coupling pipe and whirling sprinklers make rain on our garden, berries, sweet potatoes, and other valuable fruit crops to suit our needs. Extra returns from this field have already paid all cost of installation. Our sweet Porto Rico's averaged about 150 bushels per acre last year, and prospects so far this year are just as good. This year we have been averaging $2.00 for a 24-pint crate of berries, or a gross close to $500 an acre.

MRS M. A. BAKER,
R. 2, Cedar Hill, Texas.

$5 Second Prize Letter

• **"A person who has never** had to pump every drop of water in farming 240 acres will never know what electricity saves him in time, money and labor.

"Our electric motor pumps water into an overhead tank to supply a sink in the kitchen and an upstairs bathroom. The stock are never without fresh drinking water. Without this help I'm positive I would have to hire some one, but with it I am able to do my own work.

"Our electric water supply plus a garden hose does the following for me:

1. Fills wash boiler and tubs on wash day.
2. Cleans porches and dusty outside walls.
3. Washes outbuildings.
4. Fills two home-made automatic ten and fifteen gallon chicken water tanks.
5. Fills cream cans to take to cemetery where there is no water for flowers and shrubs.
6. Assists in washing car and truck.
7. Sprinkles rose bushes and shrubs before dusting with insect and blight powder.
8. Has made a beautiful yard full of grass and flowers that was bare except for weeds when we moved here.
9. Fills tubs for washing chicken feeders, troughs, bee hives, and even helped bring one swarm of bees down to earth that persisted in leaving.
10. Washes lawn furniture.
11. Fills tubs to wash garden vegetables in backyard so there is no mess in kitchen.
12. Fills fifty gallon oil barrels on back of truck in which is mixed arsenate of lead to spray garden.
13. Drowned out a whole city of rats which moved overnight into our chicken houses and yards. With a club and hose running into their tunnels we killed 25 and 30 daily until all were gone.
14. Fills another 50 gallon barrel which has an automatic water trough for hogs.
15. Assists in fighting fires inside and out. I'm one of those women who *used to* think a five gallon can of kerosene wasn't dangerous in helping to hurry up a morning fire. Thanks to running water and God, we lost nothing but time in recleaning a very blackened room.
16. The dogs are bathed in tubs in the back yard.
17. Makes a dandy shower in vine covered arbor for nightly summer baths.
18. It furnishes the water necessary in mixing shorts for hogs.
19. Fills radiators of both truck and car.
20. Small trees are now growing where before there were no young trees and the old ones all dying."

MRS. MARTIN GRAHAM,
R. 3, Yukon, Okla.

Five Letters Winning $3 Awards

• **In the fall of 1926,** the year the power line came to our farm, we decided to buy an electric pump and have running water in both house and barn. We bought a pump and 120 gallon pressure tank through our power company; the water bowls for the cows cost $2.50 each, but I can not remember the cost of pipe and fittings and faucets for the barn; however, the work was all done by my husband and sons, and my

husband said the cows produced enough extra milk that first year to pay for the water bowls and pipe in the barn. It also saved many man-hours and sometimes it had to be woman-hours pumping water out in the barnyard twice a day, no matter what the weather. Since then we have built a hen house for 250 hens and we bought pipe to run water into the feed room at a cost of about $6.00; then my husband put in a frost-proof valve at a cost of about $4.00 for material, so it can be used in winter; that water in the hen house saves much time and hard work for whoever tends hens. Now for our home. We had just a faucet at the kitchen sink at first, but later we put in a bathroom and a hot water tank also have a faucet in the cellar for cold water. I do not know how the water system in the home can be measured in terms of increased production or dollars and cents, but it gives us a sense of comfort and happiness we did not have before and surely our work is enough easier so we can accomplish more than when always finding an empty water pail waiting at the kitchen sink or outside at the pump for mother, dad or the boys to fill.

MRS. W. F. THOMAS,
R. 1, Gansevoort, N. Y.

• **Through the recent installation** of an electric water system on our Maryland farm we have been able to increase the number of hogs raised 50%. This may hardly seem possible, but in previous years only the necessary hogs and other livestock was raised due to the fact that there was no watering system but old hand pumps. In addition to more hogs, we were able to turn out six young heifer calves this spring.

The electric water system has also played an important part in the improvement of our poultry business. After water was piped to our hen house we were able to build an extension of 25 feet on our old house. This extension will house approximately 100 hens.

The electric water system has modernized our home to the extent that we are able to keep children to board from Washington, D. C., during the summer months. Living close to the city (25 miles), this is possible only because of a bathroom and running water throughout the house. Our family is very proud of this, for few such farms have these conveniences. This extra money ($10-$15 per week) may not be looked upon as an actual increase of production, but it is aiding us in buying War Bonds.

JAMES J. THOMPSON,
Poolesville, Md.

• **Production on our farm was increased** by an electric water system through the milk bucket and the egg basket. Fresh, clean water in the cows' drinking buckets at all times boosted the milk production 20 percent. Our milk receipts for the year ending June 20, 1942, show a record of 155,448 pounds delivered. It was 13,252 pounds gain over the previous year. A pipe line to the chicken house brings fresh water to the laying hens as well as the baby chicks. Plenty of clean water is an essential with poultry of all ages. And we have proved that water in the hennery aids production, for last year's record was 31,240 eggs, a gain of more than 5,000 eggs, from 250 laying hens. Our baby chicks have had the benefit of the electric water system, which has helped to keep them in a healthy condition. On April 11, five hundred and fifty chicks were put in the brooder house and up to the present time we have only lost 11 birds.

SUSAN L. BROWN,
Walden, N. Y.

• **Each year** we are able to increase our strawberry yield, even though we only have a small patch. There seems always to be a few days when berries are forming, that they need a rain, which just doesn't come; this is especially true of the everbearing kind, which yield well with plenty of moisture. It plumps the large berries and makes new ones grow; also makes the new runners on vines grow rapidly.

We also use the hose to spray melons, cucumbers, potato vines, etc., before putting on insecticide dust, instead of waiting for a dew. It is much easier than our old method of mixing poisons in water, then carrying to garden and putting on with a sprinkling can or spray pump. This same hose is used for watering stock in different pens, since it is easily adjusted and they must have lots of water.

MRS. OTTO RAMME,
Cornell, Ill.

• **I had a fine patch of strawberries**; the prospect for a crop was very flattering. A severe drought set in about the time they were ready to ripen. I saw my crop would be a failure if I did not do something about it. I bought 200 feet of used pipe and connected with a short hose, to my electric pump in the basement and by means of a hose and revolving sprinkler (which cost only 50 cents) I watered my entire patch, saved my berries and made plenty of money. I pumped water on the patch for days and really could not tell the difference in my electric bill.

I. G. EAGON,
Delaware, Ohio.

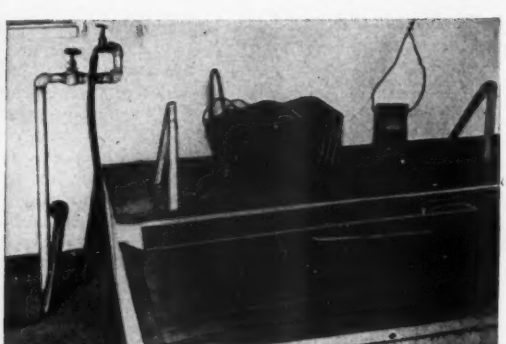
Apple Nuggets Are Good

Dehydrated apple nuggets are now being purchased in large quantities for the Army. The "nuggets" are small pieces of extra good quality applies dried down to 3-5 percent moisture. Tart varieties such as Rome Beauty, Baldwin and Stayman Winesap are best. They keep well in storage, taste good alone or with cereal, and make excellent apple-sauce or pie. One pound of "nuggets" will make 10 pounds of apple-sauce.

Milking Machine for Mice

It's scientific. A milking machine for mice is being used at the National Institute of Cancer Research at Bethesda, Maryland. It is not because of the labor shortage in this case. There is just no one who has hands small enough for milking a mouse. The Institute is studying the transmission of cancer through milk. A mouse gives about one-fourth thimbleful of milk per day.

The U. S. has 213 cities between 25,000 and 50,000, according to the 1940 census.



Left: Carl Smoke, Pataskala, Ohio, is well pleased with the results of his electric milk cooler. A check meter showed a consumption of about 80 kw-hrs per month. **Right:** This electric cooling unit was installed in an insulated tank in which ice had been used. A so-called "Drop-in Unit" makes an installation of this type very simple. Part of this tank is below the floor level, which reduces the lifting height.

Equipment for Cooling Milk

By I. P. BLAUSER,
Extension Agricultural Engineering Specialist, Ohio State University

MILK is one of the most perishable foods. Produced under the most sanitary conditions, milk always has some bacteria in it, although the number may be very small. Quality milk is clean, pure milk that keeps well and is free from objectionable odors and flavors. It can be obtained from healthy cows, kept clean. Contamination must be prevented from outside sources. Utensils must be clean and sterilized. The milker must have clean hands, and follow all the rules for sanitation and cleanliness.

Cooling Preserves Quality

The next step is the preservation of the quality of the milk which has been produced. This can be done by cooling the milk immediately after it has been drawn to a temperature which practically stops bacteria growth. It is pretty generally agreed that milk must be cooled to 50° F. or less within one and one-half hours after it is drawn, or it will not retain its freshness or quality. The question, of course, that confronts the dairy farmer is: How can these requirements be met under various conditions?

Milk is cooled on farms by one of three ways: by water, ice, or mechanical refrigeration. The method used in cooling is of secondary importance, so long as satisfactory results are secured. There are a number of factors, however, that must be considered in determining the method to be followed in milk cooling. The method of marketing the milk, local regulations, water supply, ice supply, equipment available, labor costs, and premiums all need to be taken into consideration. To produce highest quality milk, strict requirements must be met, one of which is cooling the milk to 50 degrees F. or less immediately after drawing and holding it at that temperature until delivery. Requirements for lower grade milk are less strict, and milk for pasteurization, separation, and cheese even less.

It should be emphasized that cooling milk does not improve the quality of the milk; it merely preserves the quality that is there. Likewise, milk cooling is not a substitute for any of the other factors necessary for quality milk production.

The use of water and ice have been common methods of cooling milk, and are still used to a great extent. The use of mechanical refrigeration has made rapid gains during the past few years, and no doubt will continue to increase because requirements are being raised, premiums are being paid, equipment has been improved and costs reduced.

Water Must Be Cold

Cooling with water has the advantage of low installation and operating costs. It does, however, call for an adequate supply of water at a sufficiently low temperature to meet the cooling requirements. In many instances the water that is pumped for cooling milk is used also for the livestock, so that there is very little extra cost for cooling milk. Where the milk needs to be cooled to only 60° or 70° F., cooling with water in most cases is quite satisfactory, provided enough water is used. Where it is necessary to cool to 50° F., water alone can seldom do the job.

It is quite common to speak of spring water as being as cold as ice. That is far from the fact as shown by a survey of 55 springs in Ohio where temperatures were taken. Of these 55 springs, in only 5 was the water 50° F. or lower. Eleven springs had water temperatures of 51° to 55° F., 6 from 56° to 60° F., 17 from 61° to 65° F., 11 from 66° to 70° F., and 5 above 70° F. At the same time, 28 wells were tested. Only two wells had water temperatures as low as 50° F. Twenty-one

wells had temperatures of 52° to 55° F. and 5 from 56° to 58° F.

Usually one cannot depend upon cooling milk with water to a temperature lower than 5° above that of the cooling water, and only then if a sufficient quantity of water is used. Too often we see a can of milk placed in a tub or half barrel of water, and no additional water added. About 7.7 gallons of 50° water are required to cool one gallon of freshly drawn milk to 55° F. To cool one gallon of milk to 60° F. requires about 3.4 gallons of 50° water or 6.7 gallons of 55° water.

If water can be used, the cost is usually little more than the cost of pumping, which varies from 1 to 2 kw-hrs per 1,000 gallons.

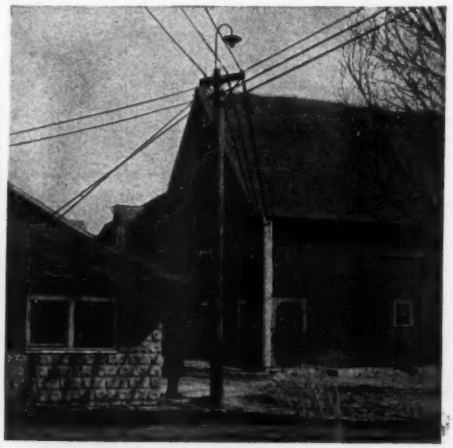
Ice-Cooling Costly

Cooling with ice, either natural or artificial, is not greatly different from cooling with water, except that ice is put into the cooling water to get low enough temperatures. In Ohio there is practically no natural ice harvested any more and an ice house on a dairy farm is now a rarity. Thus where ice is used for cooling, it is artificial ice and must be hauled from the ice plant. The amount of ice required for milk cooling depends upon the initial temperature of the water, the length of time, and temperature at which the milk is held, and the construction and insulation of the tank. To cool and store 40 gallons of milk per day requires from 75 to 125 pounds of ice per day, or an average of about 100 pounds per day, or 3,000 pounds per month. Where ice must be purchased, the monthly cost is large.

On Mr. Z. T. Smith's dairy farm near Wilmington, Ohio, where records were kept, the ice bill during the summer months ran as high as $40.00 per month. The cooling was satisfactory, but the cost was too high. When it was changed over to mechanical cooling, the cost for power was only $8.00 per month. Mr. Smith runs a small retail dairy farm.

The third general method for cooling milk, which has already been mentioned, is the use of mechanical refrigeration. The two general types to be considered here are the wet-tank, and the dry-box storage. The dry-box storage is used mainly by producer-distributors, while the wet-tank type cooler is used on most other type farms, where mechanical cooling is used. Where the dry-box storage type of cooler is used, in nearly all cases the milk is pre-cooled before placing it in the cabinet, because the cooling is much slower in air than in water.

There are now on the market mechanical milk coolers of the wet-tank type to suit the requirements of nearly every producer from one can on up. Most electric rates are favorable, and where cooling with water is not satisfactory, electric coolers show savings over ice cooling. Our records show that about one kw-hr of electricity is used for each ten gallons of milk cooled. Consumption, however, varies with the size of coolers and operating conditions. We must not overlook the fixed charges in owning and operating a milk cooler, which, on a 4-can cooler costing $250, would be $45 per year, by figuring depreciation at 10%, maintenance at 5% and interest at 6% on half of the first cost. The power cost for cooling 40 gallons of milk per day would be about $36.00 per year at 3 cents per kw-hr. Thus, the total cost of the 4-can electric milk cooler would be about $81 per year, or $6.75 per month. If ice were to be used for the same job, about 100 pounds of ice per day would be required, costing $12.00 per month at 40 cents per 100 pounds. Looking at it from the standpoint of investment cost and returns, a premium of 3.6 cents per 100 pounds for the milk would pay the entire cost of owning and operating an electric milk cooler, cooling 40 gallons of milk per day.



A good milk house is desirable for any type of milk cooling. On this electrified dairy farm a center meter pole is used, which also carried the yard light.

Farmers Favor Agitation

In talking with farmers who have been using electric milk coolers, I find that they are strongly in favor of those coolers in which the cooling water is circulated or agitated to get more rapid transfer of heat from the cans of milk. For rapid cooling, it is also important that the water be up to the neck of the can, so that there is no milk above the water line. These two points just mentioned are just as important where water or ice is used for cooling in place of mechanical refrigeration. A little more rapid cooling results if the milk is stirred in the cans during the first hour of cooling, but where the cooling medium is circulated, the advantage gained by stirring the milk is more than offset by the practical difficulties of doing the job.

To summarize briefly: To keep the freshness and quality of milk, it must be cooled to 50° F. or less within one or 1½ hours after it is drawn. The methods used are of secondary importance so long as they meet the requirement and the charges are not greater than the benefits. In many sections water is not cold enough or the supply is inadequate to cool milk to 50° F. In most cases mechanical milk coolers cool milk with less labor and cost than does ice, either natural or artificial. And finally, to get best results from any of the methods used requires careful operation and conscientious attention to details.

Electricity in Pork Production

By N. T. EIKELBERGER
Pacific Gas & Electric Co.,
Fresno, California

ABE DINKINS, progressive rancher of Elderwood, Tulare County, California, has made a noteworthy accomplishment in reducing production cost of hogs that bring top prices at the Farm Bureau Auction.

Dinkins knows just where he is going, because he keeps records and can tell what his costs are on any particular drove of pigs.

The first point is that he pastures his pigs on Ladino clover from the time of weaning up to the time of finishing.

Second, he irrigates his Ladino clover regularly and frequently with low cost water pumped by electricity and has evolved a process of rotation whereby his pasturage is protected from damage due to overfeeding.

Third, he needs to employ only three men to handle all the operations of the two hundred acre ranch and his drove of from two thousand to three thousand hogs.

Fourth, his set-up assures a low mortality of suckling pigs.

The most visible feature of Dinkins' operations is a large barn containing sixty-eight farrowing pens. Here he keeps his brood sows and their litters until the latter are large enough to be turned out to pasture. A feature of these farrowing pens is the electrically heated brooders developed by the University of California and installed in a corner of each pen. They consist simply of the boarding off of one corner of the pen at a 45 degree angle, with space allowed at the bottom for the young pigs to walk under. In these corner brooders an electric light is suspended by a cord. In a short time, Mr. Dinkins says, the young pigs learn to crawl under the brooders for warmth and shelter, and this, with a three by four inch guard rail around the inside of the pens some six inches above the floor and about eight inches from the wall, prevents the sucklings from being crushed by the sow when she lies down. Through a small access door in each pen, provision is made for the young pigs to get outside into individual yard pens.

Pigs Fatten On Pasture

When pigs are weaned they are turned out to pasture, entirely on Ladino clover. Dinkins has two hundred acres in Ladino clover. This acreage is divided into eleven pastures of which nine are in continual operation. In addition he has two feed yards for finishing.

Dinkins divides his hogs into three groups according to age and weight and allots three pastures to each of those groups. The pastures are so arranged that each group of three centers on a small corral, minimizing the labor of switching droves from one pasture to another. Each pasture is used for feeding for four days, and only four days. Then the hogs are switched to the next pasture in that group, which is also used for feeding for four days. In the meantime, the first pasture is given three days of irrigation and five days of drying and rest to allow the clover to recover its growth. Then it is ready for feeding again. Under this system hogs

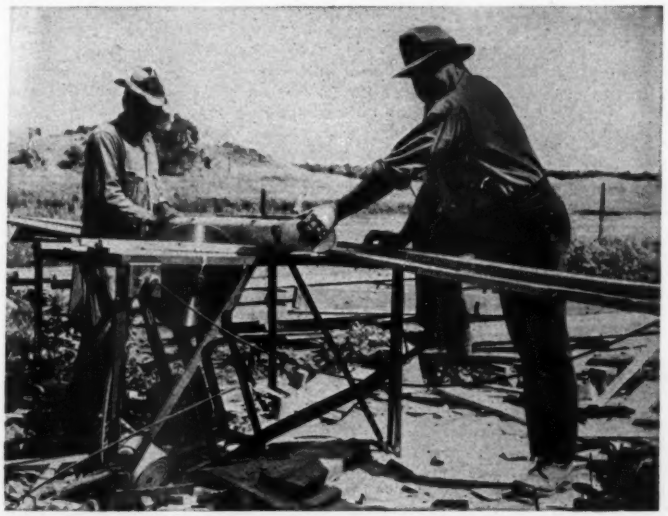
Upper: Fifteen horsepower pumping plant on the hog ranch of Abe Dinkins at Elderwood, near Woodlake, California. This plant delivers 900 gallons of water a minute, through underground steel and concrete pipes, to irrigate fields of Ladino clover used as pasturage for hogs. **Lower:** Litter of pigs finds shelter in electric brooder. Dinkins has sixty-eight brood pens, each one with an electric brooder.

Underground concrete irrigation pipes for irrigating two hundred acres of Ladino clover on the ranch of Abe Dinkins. Clover is pastured for four days, irrigated for three days and then rested for five days. Process repeats every twelve days. No other feed is given growing hogs.

are shifted from one pasture to another at four-day intervals in a twelve-day cycle. This routine is followed for each pasture in turn.

Dinkins has purchased two old refrigerator freight cars for his feed yards, which he has placed on high concrete piers so that hogs can get beneath them. The cars are filled with grain, and the grain runs into the feed troughs through chutes through the floor in which slides are placed to regulate or stop the flow of grain.

Only three men are needed to operate the whole plant. One man is charged with the responsibility of operating the farrowing pens and of caring for the brood sows and sucklings. Another man spends his time switching the droves from pasture to pasture, while the third spends all his time in watching the irrigation, stopping up gopher holes, etc.



Abe Dinkins, right, of Elderwood, who has cut costs of producing pork on hoof by pasturing on Ladino clover. Only three men are needed to operate the two hundred acres and care for 2,000 to 3,000 hogs. Dinkins also operates forty acres of oranges and forty acres of vineyard.

In his clover irrigation, Dinkins uses two pumping plants, one with a 15 horsepower motor and the other with a 10 horsepower motor.

Combined, the two plants pumped 1,429 acre feet of water (one foot deep over an acre) at a total cost of $962.92, or a cost of approximately 67 cents an acre foot of water. Last year the two plants operated approximately 5,200 hours and delivered a total of 7.94 acre feet of water per acre.

In addition, in his home he has an 8.5 kilowatt electric range, a 5 kilowatt water heater, 7 kilowatts in air heat, and a one horsepower motor for domestic water.

"I regard my electric service as of prime importance in my ranch operations," he declared. "With present low rates, by using my plants a maximum number of hours each year I am able to reduce my power costs and to maintain the efficiency of my ranches."

Milk Must Be Handled Carefully

Thousands of farmers are shifting from the production and marketing of cream to the production and delivery of whole milk. Many of them must now learn how to produce and market whole milk of unquestionable purity. Unlike cream, which often is held for several days and delivered after it has soured or ripened, whole milk must be delivered daily and reach the processing plant while it is still fresh and sweet. Care to produce clean milk on the farm, and care in grading at the receiving plant, will make the dairymen's effort count 100 percent in the Food for Freedom program.—(*USDA Circular*).

The Railway Express Agency reports that over 310 tons a year of live packaged bees are shipped from Southern States. They are shipped North in special cages, 5,000 bees to the pound.

1,357,000 tons of scrap metal had been collected up to mid-June from American farms through the 8,500 International Harvester equipment dealers.

Three- and Four-Way Switches

FREQUENTLY readers send us questions about the "hook-up" of three- and four-way switches for controlling lights. To help you, and to make it easier for us to answer these questions, which are sometimes perplexing, we have prepared this series of wiring diagrams. They show both safe and dangerous wiring.

Question 1: How do three-and four-way switches work? How many wires are necessary?

Question 2: I have a yard light controlled at both house and barn and have continuous service at both house and barn. There are only three wires between the buildings. I would like to know how this is possible.—H. W., Ill.

Question 3: I would like to know how to hook up two sets of three-way switches to control two different yard lights separately, using the same jumper wires (between switches). Will this work? On one circuit with light on a yard pole I want two control switches in the house. The light is grounded at the pole.—A. H., Wis.

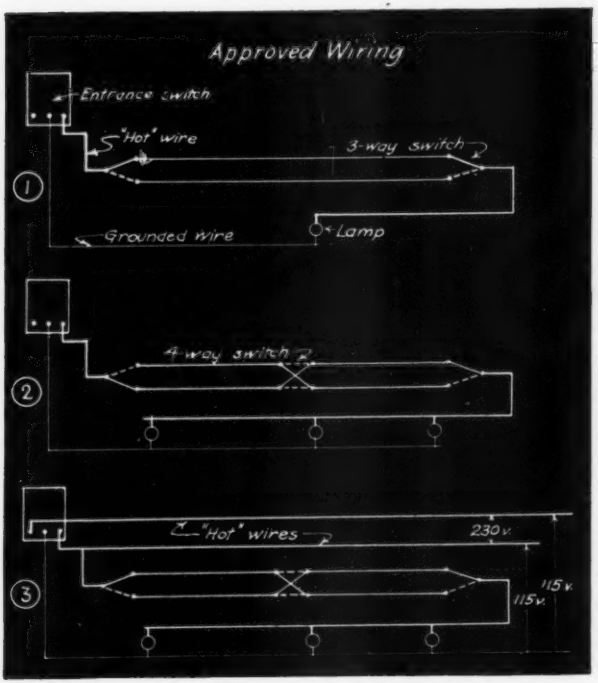
Answers: There are several ways of connecting 3- and 4-way switches to yard lights. Some are approved by the National Electrical Code. Others are not approved because of the hazards of shock, fire, current leakage, and telephone and radio interference which may result. Since there are many yard or barn lights in use which are not wired according to Code, both the approved methods and short-cuts are illustrated and explained so you can judge your own safety. After all, it is your property, and you must stand any fire loss or injury to persons or stock.

The reason for short-cuts is to save wire. *The saving is made at the expense of safety.*

The reason for Code wiring is safety. It may cost more.

In the accompanying diagrams "hot" wires, or those connected to the live side of the circuits, are represented by heavy lines; grounded circuits (connected to moist ground at transformer and service entrance) are indicated by light lines. Switches are represented diagramatically. Solid lines show current path with switch in one position; dotted lines with switch in the other position. Actually, toggle switches have connections made at top and bottom rather than at the sides as indicated. A 3-way switch has just three contacts; one at the top and two at the bottom. A 4-way switch has two contacts at the top and two at the bottom. Connect two wires from one direction at the top and the two going in the other direction at the bottom.

In studying the diagrams, imagine any switch turned from the solid to the dotted position. Trace the circuits and you will see how snapping any switch will turn the lights either on or off. Any additional number of 4-way switches may be put in the circuit just like the one shown.



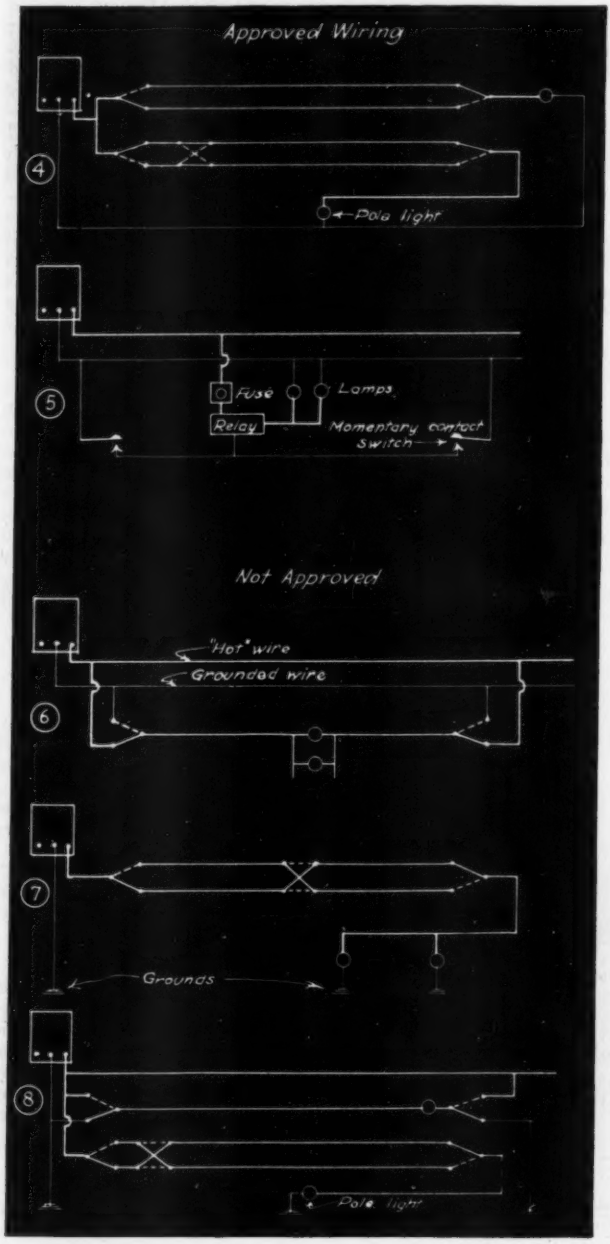
Approved Wiring

(1) One yard light controlled by switches at two different points, as at house and barn. Switches should always be placed in the "hot" side of the circuit. They open or close this "hot" circuit. The lamps are placed between this switch circuit and the grounded line.

Connections may be made to "hot" and grounded wires at the house or barn or wherever adequate circuits are handy.

(2) Additional lamps may be placed in the circuit. Each lamp is connected between the line from the switches and the grounded line,—in parallel. Additional control switches may be added; as many as desired. The two bars of the 4-way switch move together. Both are either in the solid or the dotted positions.

(3) Same as (2) but with two additional "hot" wires added to give 115v. and 230v. service for lights and appliances in addition to the switch circuits. One added wire in place of two would provide for other 115v. lights and appliances.



(4) This is in answer to question 3 above. It is just a combination of circuits (1) and (2) using a common grounded line. There is no way to use the same "jumper wires" between switches.

(5) This diagram shows an entirely different system of yard light control. The switches are spring switches of the push button type. The switch circuit remains open except when a switch is held closed. Closing a switch operates a special relay which in turn either closes or opens the lamp circuit. Any switch pushed will turn on the lights if they are off, or turn them off if they are on. It saves some wire but adds the expense of the relay and fuse. It is Code wiring.

Short Cuts
NOT APPROVED!

(6) H. W., Ill.: This is probably the way your wiring was done. There is a live circuit and a yard light controlled by two switches, using only three wires. The bad thing about this circuit is that, the lamp and circuit may be "hot" without giving light. With the switches as shown the lamp is off, but the current is on; the lamp circuit is shunted across the "hot" wire. One never knows when the wire and lamp socket are "hot."

(7) This circuit is almost exactly like that shown in (2) except that the grounded wire is omitted and each lamp is connected to ground (through a driven rod, pipe, etc.) It saves one wire. It is not approved. Satisfactory lighting depends on having perfect ground connections at each lamp and at the entrance switch, and on the conductivity of the ground, which depends in part on the moisture in it. Other disadvantages are that the currents in the soil may interfere with telephones and radios.

(8) This is in answer to Question 3 by A.H., Wis. It is a combination of (6) and (7) above and has all the bad features of both. Compare with (4) for saving in wire.

Wartime Strategy on the Farm

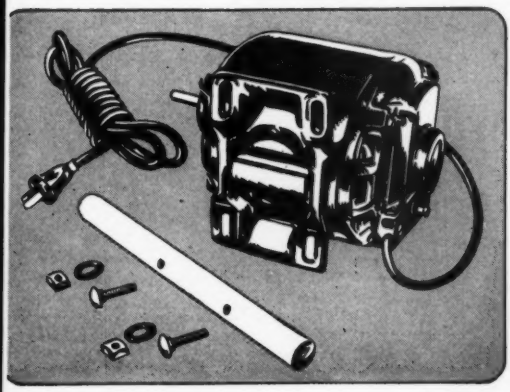
How to make a small motor portable ...for use on 21 time-taking hand jobs

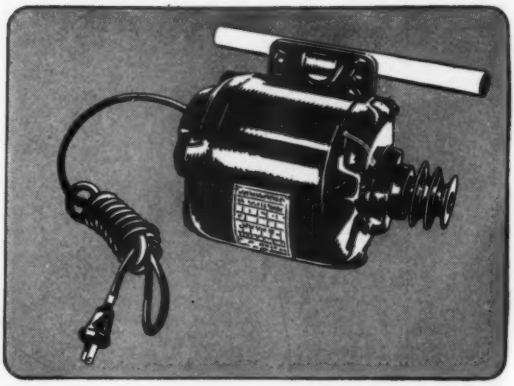
★ How can I get more done in a day? How can I get along with less help? Those are questions you and every other farmer have to answer in these days when more and more food is needed and less and less help is available.

One of the best answers is the wider use of your electric motor. A small motor can do as many as 21 different jobs for you. It can, for instance, turn your grindstone, shell your corn, and grade your fruit.

If you're using your small motor on only one or two machines, you're missing the chance to make it do many tasks for you—leaving you free for other work. Make your small motor portable and apply it to one job after another. It will be an important wartime help on your farm.

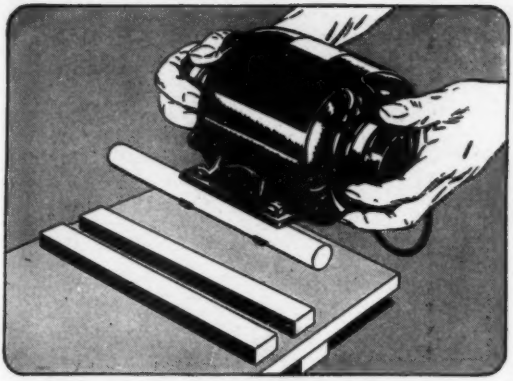
HERE'S HOW YOU DO IT:



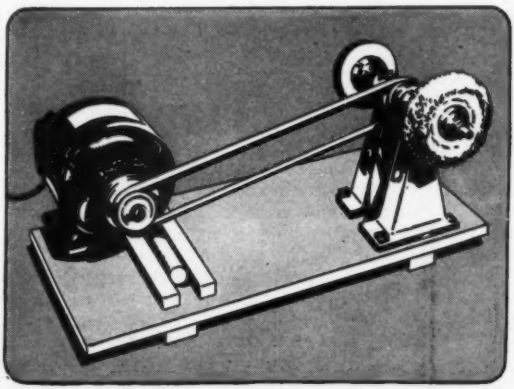


1. **EVERYDAY MATERIALS.** *The only materials* you need, to make your small motor portable, are two bolts and nuts, washers, and a rounded rail, 1" in diameter and about 10 inches long. The rail can be made of pipe or hard wood—such as a broomhandle.

2. **EASY TO DO.** *Bore holes through* the rail, and bolt it to the motor through the two holes on one edge of the motor base. To keep the bolts from protruding beyond the rail, countersink them in the wooden rail, or make the holes in your pipe large enough so the bolt head will be flush with the pipe surface.



3. TAKES VERY LITTLE TIME. *Nail two wooden cleats* next to the machine to which you want to apply the motor. Cleats can be nailed to the work bench, the floor, or the machine frame, depending on where the machine is located. Be sure the cleats are just far enough apart for the rail on your motor base to fit snugly between them.



4. ONE SMART TRICK MAKES IT WORK. *The distance of the cleats* from the machine is important. They should be located so that, when the motor is in place and belted to the machine, it will tilt away from the machine as illustrated. This way, the weight of the motor automatically keeps the belt tight. A two-step pulley using a "V" belt will be found adequate to operate most farm machines.

21 USES FOR SMALL MOTORS

MACHINE	MOST USED HORSEPOWER RATING†
Cream Separator	⅛ or ¼
Churn*	¼
Concrete Mixer (small)	¼ or ½
Emery Wheel*	¼
Lathe*	¼
Sander*	¼
Bench Saw*	¼ or ½
Drill Press*	¼ or ½
Forge Blower*	¼
Fanning Mill*	¼
Feed Mixer (small)	⅓ or ½
Corn Sheller (single hole)*	¼
Fruit Grader*	¼ and ½
Egg Grader*	⅛ or ¼
Grindstone*	⅓
Shearing Tool*	¼
Sausage Grinder	¼ or ⅓
Potato Grader	½
Pump Jack	¼ or ½
Root Cutter	¼ and ½
Small Feed Grinder (Burr)	½ and 1

*The Split-Phase Motor is recommended only for the easy-starting machines, marked in the above table by an asterisk (*). *The Capacitor Motor* or the *Repulsion-Induction Motor* will operate harder-starting machines, and is recommended for *any* of the machines listed in the table. The nameplate on the motor often tells which type it is. And your power company will answer any questions you have about motors.

†Note the horsepower required to operate each machine. Check the horsepower given on the nameplate of your motor before you apply it to any of the machines. See that it has at least the horsepower that the machine requires.

FREE BULLETIN TELLS HOW TO GET MORE OUT OF MOTORS

In 15 pages and 45 photographs and diagrams, the bulletin, "Farm Motors", gives scores of uses for motors of from ⅛ to 7½ horsepower. This helpful bulletin tells how to make the large 1 to 5 h.p. motors *portable*. It also gives facts on motor care, pulleys, and wires, and shows all sorts of ways to get your wartime work done faster and more efficiently. Send for "Farm Motors" *now*. It's free, so just write: Rural Electrification, Westinghouse Electric and Manufacturing Company, 306 4th Ave., Pittsburgh, Pennsylvania.

Westinghouse

Westinghouse Electric and Manufacturing Company, Pittsburgh, Pennsylvania

ELECTRICAL PARTNER OF AGRICULTURE

SAVE SERVICE

If your refrigerator vibrates, before you call a service man be sure it is level and standing solidly on the floor, and that there are no loose pulleys or worn belts.

Avoid getting electrical appliances wet, as wetting the heating element may cause short circuits. Usually the appliance may be wiped off with a damp cloth to remove crumbs, excess oil, grease, fingerprints, etc.

Connect and disconnect electric irons and other appliances at the wall plugs. Do not disconnect the cord from the appliance when the current is on. The reason for this is that arcing takes place more severely at the appliance plug, burning the prongs and spring contacts. These are also more difficult and costly to replace than wall plugs.

What Needs Fixing

The Kansas City Power & Light Co. repaired 10,165 items of equipment for their customers in 1941. Here is the percentage of different appliances which were brought off the shelves when the repair truck drove up:

Irons	36.81%
Lamps	19.07
Cleaners	10.81
Mixers	6.78
Toasters	5.00
Clocks	4.20
Fans	4.10
Coffeemakers	4.01
Cords	3.16
Miscellaneous	2.87
Waffle irons	1.51
Roasters	1.12
Sewing machines	.56

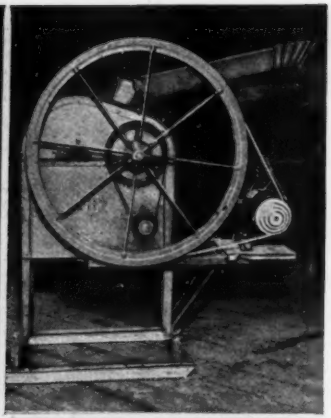
To clean a waffle iron, scrub the grids with a fine wire brush. Then brush the grids with a non-salted oil. After this, heat the iron about ten minutes. This process reconditions the iron. Excess oil may be soaked up by a piece of bread placed between the grids. It will not be necessary after this treatment to use any fat on the grids when making waffles.

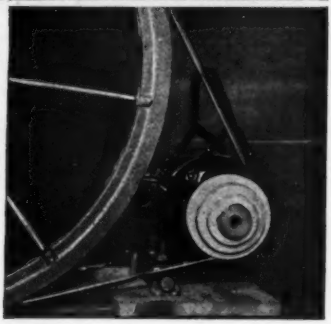
Left: This deep well pumping head is on the farm of I. M. Bierly of Bellefonte, Pa. The motor is also rigged up so it can be used for operating an air compressor shown on the shelf at the right which supplies air for his tractor and car tires. The compressor is out of an old refrigeration machine. **Right:** A. W. Wilson, R. 5, Kittanning, Pa., operates an emery wheel with the motor on his milking machine. He just takes off one belt and slips on another.

Pennsylvania Farmers Use Small Motors

PENNSYLVANIA farmers use many small electric motors for a lot of jobs around the farm. They do it because they have found the motors convenient and great labor savers. Farms in Pennsylvania may use more of these small motors than in some other states because the power companies and the agricultural engineers at the State College, working with vocational agriculture teachers, have made a special effort to show how it can be done. For instance, the West Penn Power Co. from whose territory these pictures came, have had a policy of keeping a number of used motors on hand which they would take out and install on a corn sheller or a concrete mixer or some other piece of equipment for a farmer on trial. After once trying the motor, the company could seldom get it back until the farmer could replace it with one of his own. Very often one motor can be used for several jobs as shown in some of the pictures.

The cream separator on the R. C. Campbell farm, R. 1, New Stanton, Pa., has been equipped with electric motor drive. By shifting belts the same motor also drives the barrel churn. The two jobs are not conflicting and the motor does not have to be moved.





Albert Miller of Bancroft farms, R. 2, Avella, Pa., uses his motor for a number of jobs. He has made it easy to carry about by putting on a handle of insulated wire which is attached to the upper frame bolts, and attaching a round rail to the base which acts as a hinge to support the motor and keep the belt tight when in use. All that is necessary is to set the motor down, placing the rail in the guides provided for it at each machine, and slip on the belt. Upper left: Motor is being placed on a small concrete mixer. A ¼ horsepower motor operates it easily. Upper right: Motor ready to drive the corn sheller. It takes less than a minute to move it from the mixer. Lower right: This is a close-up view of the motor on the corn sheller showing how the weight of the motor is used to keep the belt tight. There are no bolts to take out and replace when moving the motor.

Feed Mixer Saves Labor

By GEO. R. HARRISON

ROBERT CRAIGMILE, manager of Craigmile farms, near Knox, Indiana, has installed a half ton electrically operated feed mixer and now mixes all the rations for the farm's 1,200 laying hens. In addition, the mixer is used for making up pig, calf, and steer rations. Not only is the mixer a great saver of time, but of wear and tear on trucks and their tires, as heretofore the mixing had to be done in commercial plants in town.

The mixer is located in the center of a steel building that was designed for feed storage. It can be moved across the floor to any other location, if desired. It is run by a three-horse motor attached at the top of the hopper.

Craigmile Farms produces 11 of its own coarse grains for the poultry and other live stock. Only the supplements or concentrates are bought. To make a starter ration, for example, the man in charge of the mixing, turns the pages of a book until he finds the formula he wants for the specific purpose. Then into the mixer he pours in correct proportion the ingredients that are augured upward into the mixing bowl, giving the churning, and then gravitated into sacks through the sacker. Corn meal, middlings, bran, alfalfa meal, meat scrap, dried milk, limestone, salt, and other concentrates all come out in balance. The mixer does the job quickly and well.

The feed mixer, Mr. Craigmile explained, is in addition to equipment that has been in use for a long time. Some 200 acres of potatoes are put up in bags bearing the Craigmile Farms name. These are put through an automatic electric grader, washer, dryer and sacker.

"Puffed-Up" Sand New Heat Insulator

Puffed-up sand, technically known as silica aerogel, is about twice as good a heat insulator as any other substance, the American Institute of Chemical Engineers, meeting in Boston, was told. The material is now being used chiefly in the insulation of high-temperature laboratory furnaces and extremely low-temperature chambers for the liquefaction and freezing of gases. When peace comes and new household refrigerators appear in the stores, the present three-inch walls can be reduced to one and a half inches. The present six and a half cubic foot model can have its inside expanded to nine cubic feet without any increase of outside dimensions.—*Science News Letter.*

Marketing 40% cream instead of 20% will keep an extra gallon of skimmilk on the farm out of each 100 pounds of whole milk. Besides the feed value, it saves transportation.

Electrical Housekeeping

Edited by **GAIL MEREDITH**

How to Freeze Foods

THERE'S no use talking. You can't freeze foods by hearsay. Yet some folks will persist in trying it. A friend of mine prepared vegetables and fruit and meat to fill a big locker last year, and her mutterings and rumblings of disappointment over the results would be enough to shake your faith in the whole method of preserving by freezing if you let it go at that.

I interrupted her complaints one night last spring to ask her what directions she had followed.

"What directions?" she asked vaguely. "Why, I did everything *exactly* as the locker man told me to."

The state university is within sight of that locker. Experimental work on frozen foods has gone on there for years. So it has at various institutions all over the country. Bulletins with complete, careful directions for every step of the process have been published by different colleges. If this woman had lived in Timbuctu, and the mail man called each day, she could still have made inquiry of some college of agriculture, of the Bureau of Home Economics in Washington, of a county agent, or an extension worker, and she would have been directed to the latest reliable information on the subject.

Can't Get It "On the Run"

You may feel that the locker attendant should have this information. He very likely has. But it is a little too detailed to try and give a customer some busy morning, particularly if that customer is already hurrying to leave, one foot on the running board, and part of her mind already busy with the next Red Cross meeting.

It won't stick.

If you are going to freeze vegetables this fall, it is not a minute too soon to begin asking for help on the subject.

Perhaps you already know that you can't freeze every vegetable satisfactorily, not even every variety of the same vegetable. Roughly, vegetables you usually cook before you eat them will give excellent frozen products—if they are properly prepared. It is too late to select the best varieties this fall, with planting over and harvest at hand. That is next year's job.

Scalding Time in Boiling Water

Beans, green shell	60	seconds
Beans, lima	60	seconds
Beans, snap	2	minutes
Beets, young	2½	minutes
Broccoli	3	minutes
Peas	45	seconds
Spinach	2½	minutes
Swiss chard	2	minutes
Sweet corn, cut.	2½	minutes
Turnip greens.	60	seconds

—From "Freezing and Storage of Foods in Freezing Cabinets and Locker Plants" by D. K. Tressler and C. W. DuBois, New York State Agricultural Experiment Station, Geneva, N. Y.

But you can be careful in the selection of the vegetables you have. They must be tender. Harvest them as though they were to be eaten on the table this noon, by your very favorite family or guests. From then on it is hurry, hurry, hurry. The longer it takes you to get the vegetables from the garden to the locker, the greater the loss in quality and food value will be.

Pick and Be Quick

If you let them stand around in a hot kitchen for any length of time, they will lose both color and flavor.

Prepare the vegetables as you would for table use. Shell the peas and limas, snip the ends off the string beans. Wash them next in cold water. Since freezing does not sterilize your vegetables, cleanliness is an absolute essential in handling them.

Put them next in a colander or a long handled wire basket, so you can dip them in rapidly boiling water. Lift the basket or colander up and down to move the peas about and make sure that those in the center will get as hot as those on the outside.

They look and taste like fresh vegetables.

It would be true for any vegetable you are working with. The scalding arrests the action of ferments which result in lowering the quality of the food; it sets the color, and it makes the vegetables easier to pack.

After you have held the vegetables in the boiling water the proper time, lift them out and cool them down to 60 degrees F. in running cold water, drain them for one or two minutes, and pack them promptly.

Since freezing also has a drying effect, the container must prevent loss of moisture from the product if the quality is to be preserved. Cellophane bags in paper cartons are desirable for vegetables. Glass is not so good because it is hard to get the frozen product from them without thawing, and the vegetables should be plopped into boiling water before they have begun to thaw.

Some experimenters recommend that individual containers hold no more than a quart.

Set the packages of food into the freezer just as fast as you can, and have them so placed that the freezing will be as rapid as possible. If you cannot get them into the freezer within an hour, put them in the refrigerator or pack them in crushed ice.

Before you start your freezing, get all the information you can. Read and study and talk to your neighbors who have been successful in saving food that way. Ask your county agent or home adviser for help.

Don't guess.

Sugar Banks

After they had their sugar ration books, the Richardsons spent some time puzzling over how they could give each member of the family a proper share and still stay inside the limits of that half pound a week. So Dwight, who works with figures all day, sat down and worked out just how much sugar each one of them was allowed a day.

I do not mean that it was an intricate problem. One cup of sugar is half a pound, and one cup of sugar is 16 tablespoons. Figuring out the daily allotment is easy enough, but spreading it around for practical use is a different matter.

They settled on this plan. There was to be one tablespoon apiece and another tablespoon from each of them for the cook, with two tablespoons left over during the week for emergencies.

It was then that Marion had the idea of the banks—the sugar banks. One for every member of the family and one for the cook. Of course, Marion is the cook, too, but that did not give her a double amount of sugar. She went down to the basement and brought up five little jars with tight screw tops. One she labeled Mother, one Dad, one Polly, and one Lorna. The cooking jar had no name.

Sugar Rationed Daily

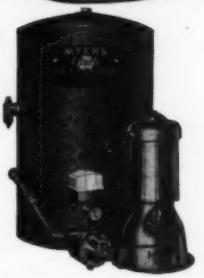
Each morning, Polly, who is the older of the two girls, measures out the sugar for the day. After that each member can save or squander his day's supply

WATER YOUR GARDEN
Regularly THIS SUMMER!

Grow More and Better Vegetables
1. for your table
2. for canning
3. to conserve food for the war.

By properly watering your garden this summer, you can grow the same crisp, tasty vegetables as during the spring months—and get the same big yields of these fresh vitamin-rich foods all season long. But even a short dry spell may do untold damage unless you prevent it by watering. When you sprinkle, soak your garden thoroughly—about one-half inch of water is needed every few days during dry periods. Many tests show an average yield increase of 40% by proper watering.

Use water liberally for your farm animals, too. Keep a fresh supply before them day and night and they'll produce more. Have your present well equipment and water system inspected to assure efficient operation. Call on the experienced Myers dealer near you. Mail the coupon now!



War shortages of materials curtail production in practically all industries. So conserve your present equipment by giving it prompt attention when something goes wrong.

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without warning nudges or scowls from any of the family.

If Daddy would rather have two teaspoons of sugar in his coffee and none on his cereal, that is his choice and no one criticizes or complains about it.

Polly and Lorna have learned to eat honey on cereals, and orange and grapefruit with no sweetening at all. Polly has been so careful of her sugar that her jar is almost full. Nobody knows what she is saving it for; she isn't sure herself. Maybe Mother can borrow some next month to make Polly a birthday cake with real frosting.

It would be fair enough, wouldn't it? Nobody could think it extravagant if Polly had gone without sugar on other things she liked to have it all at once on something she could share.

If we had two little girls, I would hope that we could work out our sugar rationing as simply and fairly.

Saving the Heat

If we could save up heat, August would certainly be a good month to start. It is anyway, even if the heat we're trying to save is just a little extra that may be getting away from us when we are using our electric ranges.

Anytime we do not need it for the cooking we are doing, we're wasting it. And waste in the kitchen—so folks make us feel—is in a fair way toward becoming treason in the eyes of the nation. Anyhow, we are out to prevent it everywhere we can.

Not long ago I walked through a woman's kitchen just before noon and saw a pan of potatoes bubbling away on the stove. The two quart pan, uncovered, was almost full of water, boiling explosively with the intense heat of the burner on high.

She was certainly using more heat than she needed to keep that water boiling. Maybe this was carelessness; maybe she did not know that water is at the same temperature whether it boils gently or furiously. She was taking more heat to keep the water boiling in that open kettle than she would have needed if she had clapped a tight fitting cover on as soon as she put it on the stove.

Don't Waste the Vitamins

Cooking the potatoes in quarts of water wastes a good share of their minerals and vitamins. The least possible amount of water that would keep those potatoes from sticking is best. That would help her cut down the waste of food she had helped to raise, had dug, perhaps, before she prepared them for the kettle. It would cut down on the heat she would need to do the cooking. Less heat, less current. Less current, less cost. I do not think this women was unusual. Most of us are guilty of some carelessness that wastes heat in our kitchens.

Some of us heat a whole teakettle of water when we need only two cups. Some of us forget to heat the water in the utensil we are going to use, even though that is cheaper. Some of us let lime in the tea kettle drag out extra heat when we could prevent that waste by removing the lime often.

Some pans squander heat every time we put them on the stove. Flat bottomed pans that are just the size, or the very least little bit wider than the unit are best. If the pan does not cover the unit, part of the heat goes up in thin air. If the pan is a good deal too large, so large that it extends out over the top of the stove, the heat from the bottom of the pan may check the enamel.

A dull surface on the bottom of the pans absorbs more heat than a bright one. You can save on the scrubbing and save on the heat if you do not polish the pans too brightly.

If you are really serious about wanting to save heat, you can do a little planning on the use ot your oven, too. Try to do as much baking or oven cooking as you can while the oven is hot. When you are cooking a roast, plan a pudding. Have the food ready to go in when the oven is ready for it. If you start preheating the oven too long ahead, you may be called to the telephone before the cake is ready to go in. And you know how long that may keep you.

Keep Oven Door Closed

Discipline yourself not to open the door every few minutes to watch the baking. You do not have to. Know how long your food needs to cook; know what temperature the oven should be. The thermostat will keep it at that temperature. All you have to watch is the clock. Every time you open the oven door, you're bound to waste a little heat.

Remember that just as soon as foods come to full steam, the switch on the surface units can be turned to lower the heat. You can do a good deal of cooking with the current turned off entirely. It is thrifty to use this free heat for the last of the cooking.

Roast 'er With Care

Most of us are hoping that with good care our roaster ovens will last us through the war and on into the peace while factories are reshaping their machinery to make tools for homes again.

Good care for any roaster is a very simple thing—and should

provide for both the well being of the roaster and its successful operation.

Plug it into a convenience outlet in an appliance circuit. Make sure that no other appliance with a heating element is connected to the same circuit. The two may call for so much current that it overloads the wires. That goes for roaster and broiler, too, remember.

Do not try to make the roaster reach beyond the length of its cord with an extension cord, nor connect it to a drop cord from the ceiling. The wire in neither of these is likely to be suitable for such heavy duty.

When you are using the roaster, be sure to leave the inset pan in for most of your cooking. Put the small pans inside that pan, not in the shell of the roaster itself.

It is easier to keep the roaster clean if you wipe off any spots before they have a chance to bake on. Keep the cover shining clean. After the food has spilled over, or stubborn spots have baked on the inset pan, soak it; don't scrape. Many spots will wash off and the rest will yield to a little scrubbing with a very mild scouring powder.

My Refrigerator Saves Me Money This Way

(*May Contest Winner*)

"My electric refrigerator does not save me money all at once but day by day there is a saving that amounts to a goodly sum in a year. First there is a saving on the ice bill, which amounted to $40 a season. In the cool months I used the cellar and in freezing weather an outside box. That arrangement was not very satisfactory as food would freeze and sometimes a stray dog would help himself to whatever happened to be in the box the night he called. One night he ate $1.50 worth of sausage, much to everyone's disgust.

"Leftovers are generally hard to get rid of and with the old ice box were thrown away after the second day. With the electric refrigerator they keep several days, so with a little careful planning and fixing up I serve them the second time and they are all eaten up.

"Milk is kept perfectly the electric way. Heretofore many a quart of milk spoiled and sometimes it was hard to use it up in baking. If you didn't need the food it was more costly to use it in cakes and biscuits than to throw the milk away.

"Once a week a trip to the city, a distance of eight miles, is made for the meat, vegetables, fruit and groceries. Now that gasoline and tires are rationed this is a big saving. I keep some of the meat, also fresh fish, in my freezing compartment and I have never had a piece spoil. In fact, the freezing makes the meat tenderer. I buy different cuts of meat so have variety in my meals.

"Ice cream is a dessert we all like, so it is served often as I can make it cheaper than the commercial product. There are other frozen desserts I make in the hot weather which are enjoyed more than pies and hot puddings. Fruit juices taste better when chilled

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and my family drinks them daily. This helps them to maintain good health and lessens the doctor bils.

SUSAN L. BROWN
R. 1, Walden, N. Y.

The Bureau of Home Economics Tells You How to

Stretch the Rubber

Overshoes, Galoshes, Rubber Boots

Where are your winter's galoshes? Tossed in a heap on the attic floor with the mud of some spring storm crumbling on the soles? Better hunt them up apologetically and wash them clean with soap and water. Dry them in a cool, airy place, and stuff them with wadded up papers. Then find some cool, dark place to store them.

Clothing

Wash girdles, garters, and suspenders with mild soap and warm water, stretching them as little as possible. Dry them in a cool, breezy place, away from both heat and sunlight. You can hurry the drying by rolling a girdle in a dry towel, folding it lengthwise so the supporters won't cut it, then hanging it up.

Hot Water Bottles

Dry them out well after you use them. Store them in a flat box, away from radiators and never in the sun. Be sure to coil the rubber tubing loosely with no sharp bends, and no sharp objects near it to cut through the rubber.

Sheets, Aprons, Raincoats

Spread these out on a table and scrub them with a soft brush and warm soapy water. Rinse, then wipe them dry with a cloth. Hang them up out of the sun. Dust sheets, aprons, or raincoats with talcum powder or cornstarch before you fold them away.

Wringer Rolls

When you start to use the wringer, make sure that the pressure of the rolls is evenly distributed. Perhaps the adjustment on your wringer is made automatically, but in some machines it is done with hand screws. Do not try to put too much clothing through the wringer at a time. Fold buttons and buckles inside the clothes before you start them through. Always release the pressure on the rolls when you've finished using the wringer. If you do not, the rolls may stick together.

When you are through washing, clean the wringer rolls carefully. Remove any discoloration with kerosene or carbon tetrachloride. If you use kerosene, wash every bit of it away with soapy water, then rinse and dry the rolls carefully. Keep the wringer covered up, between washings.

Refrigerator Gasket

Because oil and grease are foes of rubber, be careful not to touch

Wash the rubber gasket once a week with warm soapy water.

the rubber gasket around your refrigerator door with your hands as you open and shut the door. The oil from your fingers it allowed to stay on the gasket, will injure it, so wash the gasket with warm soapy water each week.

August Contest

Five dollars for the best letter on the subject: "We like an electric water heater". We'll probably think it is best, if you tell us clearly and definitely how that water heater has—or could—revolutionize your housekeeping.

Send your letter to Gail Meredith, 700 S. Mills St., Madison, Wis., by August 31, 1942.

Mixer Stops Late Hours

The electric mixer was made to save time, labor and strength; and mine has done just that. For the past nineteen and one-half years I have attended a farmers' market every Saturday and besides the different farm products, I also made from seven to fifteen cakes to sell. And how my hands and fingers would ache on Friday night after I was all through. My shoulder began to hurt too, from the creaming and mixing. Many times I have stayed up until 12 or 1 o'clock getting things ready for market. About eight years ago my daughter made me a present of a Mixmaster, and the change from the old way to the new has been marvelous. I am always through by nine o'clock now and sometimes by seven, and my hands never ache from creaming sugar and butter and beating eggs. I also enjoy mixing salad dressing, whipping cream and potatoes with my mixer. I couldn't do without one now.

MRS. LEONARD E. STUBBLEFIELD
Bloomington, Ill.

Feed Pigs Early

Secretary Wickard says everyone should push the feeding of pigs as much as possible to keep from overloading trucks, railroads and packing plants between Thanksgiving time and Washington's birthday, the normal marketing period. Price ceilings will not permit prices to advance much, if any, and the pigs will be needed early.

Lightning Produces Fertilizer

Two billion lightning strokes—about seven for every square mile of earth—do much good, according to the Westinghouse Engineer. These thunderbolts streaking through the atmosphere at 60,000,000 miles an hour release nitrogen from the air. This nitrogen as nitric acid falls in rain drops and enriches the soil. Nearly 100,000,000 tons of nitric acid are produced by lightning in a year, —more than the total production of all the world's fertilizer plants.

Timothy hay was named after Timothy Hanson, who carried the seed from New York to Carolina about 1720.

By JEROME J. HENRY

From the Wrong Side of the River

Virginia Paine, NBC dramatic artist, was fresh out of a dramatic school when she tried out for her first important position at WLW in Cincinnati.

Meet Captain Flagg, who may be better known to movie-goers and radio listeners as William Gargan. With his buddy, Sergeant Quirt (Edmund Lowe), he brings listeners amusing tales of life in the Marine Corps.

The role was that of Honey Adams, heroine in a Southern drama. It required two actresses, one to carry the singing, and the other for the straight dramatic parts. The production director had already auditioned 40 actresses, most of them genuine Southern girls, but he couldn't find one with enough of "you-all" in her voice. But he liked Virginia's voice, selected her for the part.

After the contract papers were signed, the director asked Virginia what part of the South she was from.

"I had to confess," says Virginia, "that I had always lived in Cincinnati. He was a nice man. He let me keep the job."

One Audition and In For Life

Little did Bernadine Flynn dream that she was heading toward a more or less life-time job in radio, when she was auditioned by NBC in 1930.

"Bern" got that first job and then on June 29, 1932, she made her debut as "Sade" in the serial "Vic and Sade." That was more than 10 years ago and "Bern" has been playing Sade ever since.

In real life, "Bern" is the wife of Dr. C. C. Doherty, and the mother of a four-year-old son.

Career as Violinist Wrecked by Allergy

Percy Faith, maestro of the "Carnation Contented" program might have been a great violinist.

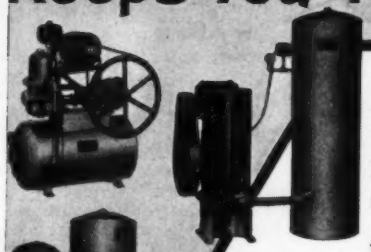
At least his family expected him to be successful when they started him off with violin lessons at the age of six. The resin from the strings made young Percy ill. But the boy was so delighted with the lessons that he persisted for three years before the doctor persuaded him to take up piano.

By the time he was 11 he had a professional job—playing cowboy and Indian music in a Toronto, Canada, movie house. Then he went eventually to the Canadian Broadcasting Corporation where he was staff conductor, arranger and pianist.

Those who would "kid" Percy about his name should remember that he is an expert boxer, just as nimble with his fists as he is with his fingers on the keyboard.

F. W. Frasier, Extension Poultryman, Washington State College says: "If the egg room temperature is above 60°, you lose about 2c per dozen on all the eggs held over 3 days. Egg quality deteriorates as much in 6 hours at 90° as in 6 days at 50°."

RUNNING WATER Keeps *You* Healthier—



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Running water will also keep your livestock healthier. Among Aermotor's many models of deep, shallow well, and jet pump units there is one especially suited for your job. All Aermotor systems are so trouble-free they furnish you economical pumping for years.

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Questions and Answers

Home Built vs Factory Built Freezers

▶**Question:** *Can you tell me whether it is cheaper and as satisfactory to have home freezing cabinets built as to buy the patented ones?*

We have a small family but it seems to me it would be fine to save our friers from chicken thieves and get them off the feed at the right time. Also we would like to kill a fat steer now and then and freeze the garden things that can take it.

J. M. M., La.

▶**Answer:** The relative cost of a factory made and a homemade freezing cabinet will depend upon how much of the labor on the cabinet can be done at home and whether you have insulating materials available at low cost.

Washington State College at Pullman, Wash., has a bulletin on the making of freezing cabinets at home, using sawdust for insulation. The materials for such a box in the State of Washington cost considerably less than a manufactured box. It is, of course, much easier to do a good job of building a cabinet and installing refrigerating equipment in a factory prepared for that kind of work than it is to have it done locally by someone who is not fully familiar with the building of refrigeration equipment.

So far as I know, few if any, of the commercial freezers are patented. They are built by companies that make other types of refrigerating equipment and are sold on the basis of design and quality of materials rather than on patented features. Unless you know an experienced builder and refrigeration man who could construct your cabinet locally, you would probably get off just as cheaply and have a better box if you bought it ready made.

Motor on Bread Mixer

▶**Question:** *I have a bread mixer with a capacity for making eight loaves of bread and would like some plans on putting on an electric motor.* H. McC., Ore.

▶**Answer:** I am not sure you can use a motor on your bread mixer. It it turns with a crank having a horizontal shaft, you might use a speed reducer on it similar to one made by A. H. Mutschler, Middleburg, Pa., and shown on page 26 of our January issue.

Burglar Alarm

▶**Question:** *I would like to wire my garage for a burglar alarm, using a 6 volt transformer and running a wire over windows and doors so that when they open a bell will ring. How can I do this?*

C. V., Pa.

▶**Answer:** Special burglar alarm transformers and supplies are sold by the Lyon Rural Electric Company, San Diego, Calif., and by Patrick & Wilkins, Philadelphia, Pa. Instructions are sent with the equipment. You may also obtain instructions regarding burglar alarms by addressing the Extension Department, Pennsylvania State College, State College, Pa.

Incubator as Dehydrator

▶**Question:** *Have you any information on using an incubator for the purpose of drying fruits and nuts? I have a small one with a capacity of 1,200 eggs but if I used the hatching baskets I believe the capacity would be greatly increased. It is electrically controlled with a fan.*

H. McC., Ore.

▶**Answer:** A small electric incubator would hardly be suitable for drying fruits and nuts. The incubator is made to provide humidity as well as heat so the eggs will not dry out. With some types of incubators it might be possible to provide vents and use fans for removing the moisture. It would be necessary also to add more heaters.

Large Size Egg Coolers

▶**Question:** *I am desirous of obtaining information on egg coolers for eight or ten cases of eggs.*

Have been informed by the New Jersey State College of Agriculture that you have published an extended discussion of cooler experiences and modifications in the July 1941 issue of your magazine.

If this issue is still available or you can obtain a copy of the article and send it on to me, I would greatly appreciate it.

J. C. F., New York

▶**Answer:** The most reliable egg cooler is a large mechanically cooled box of either the walk-in or milk cooler type. Our July 1941 issue of ELECTRICITY ON THE FARM containing an article "Coolers Boost Egg Income," by Prof. W. C. Krueger of the New Jersey Extension Service, describes the use of fans and water spray for cooling eggs.

If your well water is as cold as 50° in the summer time, you might make a cooler by using old truck radiators as the cooling unit and fans to circulate the air. The water can be used in stock tanks or for

FREE BOOK!

"The Magic of Hot Water"

Every farm home should have a copy of this book. It tells of many ways in which hot water can be made a better household servant. Also, it gives valuable facts about various types of cleaners for home and dairy purposes. Send for it now.

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DAIRY-MAID

WATER HEATER

Makes a hit with the dairy farmer because it enables him to protect his *milk check* with less effort and at small expense. Low wattage heating plus automatic control and heavy insulation keep operating costs down. No expensive installation. Just plug it into outlet.

A Demonstration FREE!

Let us arrange for you to try the Dairy-Maid for thirty days without cost or obligation. Write for offer now.

BABSON BROS. CO.

2243 West 19th Street, Dept. C-551 Chicago, Ill.

"I brought our mess sergeant home with me, mom. Will you *please* teach him to make biscuits?"

irrigating lawns and gardens. Such an egg cooler as this, is under development at the University of Nebraska, Lincoln, Nebraska.

Pig Brooder Construction

▶**Question:** *Will you please advise where I can find information on the construction of an electric pig brooder, including the size of bulb and the kind of reflector necessary?*
R. R. S., Wis.

▶**Answer:** We have had a number of articles in ELECTRICITY ON THE FARM regarding farmers' experiences with pig brooders.

The best type of reflector to use with ordinary Mazda lamps is an RLM Dome reflector which is white enamelled on the inside. The best reflector to use with CX lamps is aluminum. Aluminum reflects ultraviolet better than white porcelain does.

The wattage of lamps used averages from 100 to 250. It will depend somewhat on the weather but in most cases, a 150-watt Mazda lamp placed about 16 in. above the floor will do the job very well.

Pressure Booster Pump

▶ **Question:** *Is there a "booster" on the market to step the pressure up in a 2 in. water line from 12 lbs. to 30 lbs.? If so, would appreciate any information on matter.*
D. P., Ohio

Answer: A motor-driven shallow-well water system centrifugal pump with proper pressure controls and expansion tank may be used as a booster in your 2 in. water lines. It should be installed just as you would install a water system with the suction pipe connected to the supply line under twelve pounds pressure and the discharge adjusted to vary from say 30 to 40 pounds pressure between the cut-in and cut-out point of the pump. This assumes you will have intermittent demand for water. If there is to be a constant, uniform flow through the pipe, you can use a direct connected centrifugal or turbine pump as a booster without pressure tank or controls. Speed and size of pump and demand for water will govern the discharge pressure.

Portable Motor Operates Shelled Corn Elevator. In the foreground is a 5 hp motor mounted on a homemade truck with a gear reducer for use on jobs where a relatively low speed is necessary. The motor has a 150-foot flexible attachment cord so it can be used in many places about the farmstead. It is on the farm of Nolan Bros. of Lowell, Indiana. It is used regularly in the grain storage building, but is connected here in the yard for elevating shelled corn into a storage bin. The spout from the power sheller located on the truck discharges into the portable elevator.

Motor on Small Separator

▶ **Question:** *I have a small table model cream separator run by hand; also I have a ¼ hp motor which I use to pump water and some other jobs. Is there any way I can use it to operate the separator? As help is so hard to get now, if I could arrange it I could wash the dishes while electricity did the separating.*
E. B., Iowa

▶ **Answer:** I regret that I cannot give you a definite answer to your question about driving your table model cream separator with a ¼ hp motor. Some of these table model separators can be converted to motor drive and some of them cannot. The DeLaval Company has an attachment for driving their small separa- . . . . . (More on page 26)

Monarch ELECTRIC and COAL-WOOD COMBINATION RANGES

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FREEZE FISH, POULTRY, MEATS, FRUITS and VEGETABLES

Illustration shown, 14 cubic feet, holds 1,000 pounds of food.

FREEZE NOW — Eat Months Later

For the FARM, Home and Merchants
Ask us for details. Have your Locker Plant in your home.

By conserving food you will help win the war — BUY NOW!

Freeze at Low Prices — Eat at High Prices — Let the Savings Pay for Your Freezer — Convenient Terms If Desired.

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1639 Lafayette Rd., Indianapolis, Ind.

Some Territories Still Open for Distributors and Dealers

Names and addresses of manufacturers of the articles described in this column will gladly be furnished upon request to What's New Department, ELECTRICITY ON THE FARM, *24 West 40th Street, New York, N. Y.*

Plastic Sprinklers

The illustration shows sprinklers and hose attachments now being made of durable plastic to save brass for war use. They are light, "warm" and smooth to

handle. The small round nozzles at the bottom are "Bomb" nozzles which produce a fine, dense spray for combating incendiary bombs but also useful for spraying vegetables or flowers on display and for watering, where a fine spray is desirable. Available from hardware, department and chain stores at reasonable prices.

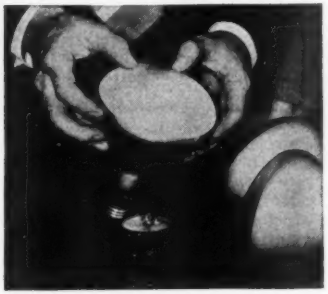
Fluorescent Extension Lamp

This portable fluorescent lamp is 9½ in. long, 1 in. in diameter

(1¾ in. deep in steel-grille shown) and weighs 2½ lbs. Furnished with gray and white baked enamel reflector and grille, ballast equipment and 12 ft. cord. Use on 110 to 125 v. circuits. It gives a cool light with a minimum of glare and consequent eye strain. It is known as a P-7 lamp and sells at $9.50. A-1 priority necessary.

New Sun Lamp

A new sun lamp which may be used on an ordinary lighting circuit without auxiliary transformer or ballast will be available in August in limited quantities. It is pictured in the illustration. It has an inside reflector protected from dirt and corrosion so the lamp maintains a high output throughout its life. The ultra violet is produced by a mercury arc with a starting device within



the bulb itself. It may be used on voltages from 100 to 125, consumes 275 watts and will retail for $15. It is known as the Mazda RS sun lamp and is intended for use on humans and animals.

The quality of radiation is similar to the S1 and S4 lamps; the exposure time recommended is about the same as for the 400 watt S-1 lamp and the 125 watt S-4 lamp when the latter two are in standard reflectors.

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Questions and Answers

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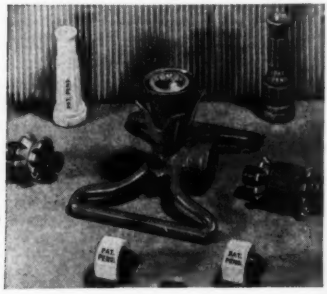

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